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BY Richard D. Bach

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

KLAUS-PETER CRONE ET AL

SERIAL NO.: 09/744,722

FILED: MAY 7, 2001

FOR: METHOD OF PRODUCING
SOLAR CELLS

Assistant Commissioner for Patents
Washington, D.C. 20231

) ART UNIT: 2812

) EXAMINER: S. MULPURI

TECHNOLOGY CENTER 2800

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RESPONSE

Sir:

The present application has been carefully studied and amended in view of the outstanding Office Action dated January 14, 2003, and reconsideration of that Action is requested in view of the following comments.

Claims 1-9 are presently pending in this application and acknowledgement as such in the outstanding Office Action. However, only claims 1-6, 8 and 9 are addressed on the merits. Accordingly, applicant respectfully requests the current status of claim 7.

Applicant respectfully submits that the present invention as recited in claims 1-9 is neither disclosed nor suggested by the prior art taken alone or in combination with one another. Specifically, claims 1-6 are not rendered obvious by Mitlitsky et al US 5,714,404 ("Mitlitsky") and Takenouchi et al US 5,427,961 ("Takenouchi"), and claims 4-

6 and 8-9 are not rendered obvious by the combination of Tadatake JP 05090624 and Mitlitsky, for the reasons expressed below.

Tadataake simply describes the application of a semiconductor ink on a PET-film. The reference fails to disclose that the support comprises a transparent substrate layer that is electrically conductive, and also fails to disclose that the photovoltaically layer is annealed. Although it was known from Mitlitsky to anneal photovoltaic layers, an artisan would not have applied the teaching of Mitlitsky to the material of Tadataake or vice versa because PET is not included in the "low-temperature substrates" defined and identified by Mitlitsky at column 3, lines 14-19. As previously argued to the Examiner in response to the Office Action of March 4, 2002, the "low-temperature" supports of Mitlitsky are commonly known as high-temperature substrates and do not include PET.)①

Therefore it was neither known nor rendered obvious at the time of the present invention was made, to anneal a photovoltaic layer on a support with a low glass transition temperature and without damage of the support. This holds all the more for a photovoltaic layer on a support comprising a transparent electrically conductive substrate layer. Accordingly, it is respectfully requested that the rejection of claims 4-6 over the combination of Tadataake and Mitlitsky be withdrawn. Claims 8 and 9 are related to claim 1, which is neither known nor obvious from Mitlitsky and Tadataake, and therefore the rejection also should be withdrawn.

Applicant respectfully agrees with the Examiner that it was obvious to use very small particles in the range of 3 - 5 nm with regard to conversion efficiency of the solar cell. As photoprocesses depend on the absorption of light, it would have instead been obvious to use large particles for a high efficiency. Applicant surprisingly found that it is

preferred to first deposit very fine nano-particles and afterwards enlarge them by) (2) annealing to obtain solar cells of very high efficiency.

Although the Examiner has accepted at page 7 of the Office Action that Mitlitsky does not disclose substrates with glass transition temperatures as presently claimed, page 3 still reads that Mitlitsky discloses plastic materials with a glass transition temperature of not greater than 180°C. Accordingly, to the Ullmann's Reference provided to the Examiner with the response to the Office action of March 4, 2002, page 462 shows that PES has a glass transition temperature (T_g) of 223°C. Mitlitsky's "low-temperature" is only meant as in relation to "high-temperature" polymers described at column 3, lines 8-13.) (3)

Mitlitsky's disclosure only focuses on the chemical inertness of the material, which is clear to an artisan when reading column 3, lines 1-45 and when seeing the preferred, predominantly chlorine, fluorine or ethersulfone polymers at column 3, lines 14-19.

Therefore Mitlitsky neither teaches nor suggests the use of a support material with a glass transition temperature as presently claimed, and an artisan would not combine the teaching of Mitlitsky with the alternative film material PET known from Takenouchi, because he would have learned from Mitlitsky, column 3, lines 1-45, that the temperature resistance of the support is crucial during the annealing even for the conditions of Mitlitsky's invention. Moreover, the artisan would have learned from Mitlitsky that the material must stand up to 180°C, and from Takenouchi, column 3, lines 53-55, that polyimides and fluoroplastics are particularly preferred from the viewpoint of thermal resistance. This would have taught an artisan to choose the fluoro polymers

from Mitlitsky's list at column 3, lines 14-19, e.g. E-CTFE, E-TFEM PVDF and [TFE, but no PET, which is not mentioned by Mitlitsky, and according to Takenouchi the worst with regard to thermal resistivity (column 1, lines 37-53 and column 4, lines 42-46) and on known annealing conditions would be unstable and produce oligomers. Therefore, Takenouchi in fact teaches away from using PET for the invention of Mitlitsky. Accordingly, claims 4-6 are neither anticipated nor rendered obvious by Mitlitsky and Takenouchi, and it is respectfully requested that the rejection be withdrawn.

With respect to claims 1-3 and the rejection thereof over the combination of Mitlitsky and Takenouchi, the same arguments made above are equally applicable. The artisan would not use PET in the invention of Mitlitsky. Takenouchi teaches the opposite. Accordingly, claims 1-3 are new and inventive over Mitlitsky and Takenouchi, and the rejection of these claims should be withdrawn.

As previously advised, applicant takes notice of the double patenting rejection and it is currently considering the abandonment of co-pending application serial no. 09/890,393 or alternatively whether a Terminal Disclaimer should be prepared and filed. Appropriate action will be taken in response to the double patenting rejection by either one of these two options. In either event the double patenting rejection will be rendered moot by the abandonment of the co-pending application or the filing of an appropriate Terminal Disclaimer.

Accordingly, for the reasons expressed above it is believed that the present application is in condition for allowance and early Notice to that effect is respectfully requested. Moreover, should the Examiner continue to reject any of the claims it is

respectfully requested that a telephone call be made to applicant's counsel in order to discuss the merits of the present invention.

Respectfully submitted,

CONNOLLY BOVE LODGE AND HUTZ LLP

By Richard M. Beck
Richard M. Beck
Reg. No. 22,580
Telephone: 302 658-9141

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